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Applicant: **ZANUSSI GRANDI IMPIANTI S.p.A., via Giardini Cattaneo, 3, I-33170 Pordenone (IT)**

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Inventor: **Del Fabbro, Claudio, via Veneto 1, I-33080 Porcia Pordenone (IT)**

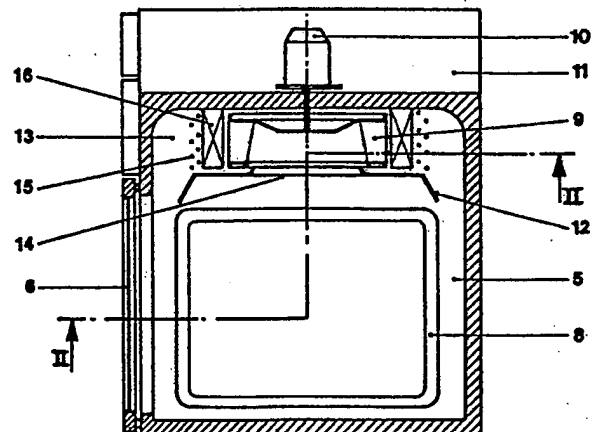
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Representative: **Patentanwälte Grünecker, Dr. Kinkeldey, Dr. Stockmair, Dr. Schumann, Jakob, Dr. Bezold, Meister, Hilgers, Dr. Mayer-Plath, Maximilianstrasse 58, D-8000 München 22 (DE)**

Forced convection oven.

A forced convection oven has a cooking chamber (5) enclosing a motor-driven fan (9, 10) mounted adjacent a wall thereof and surrounded by heater elements (15) for heating air flowing towards the cooking chamber.

According to the invention, a circular diffuser (16) having numerous blades (17) of curvilinear shape is disposed between the fan (9) and the heater elements (15). Diffuser (16) is effective to deflect the air escaping from fan (9) to substantially radial directions with respect to the fan axis, and to reduce the air outflow velocity, resulting in a more uniform temperature distribution within the cooking chamber.



EP 0 152 571 A2

1 Forced Convection Oven Description

5 The present invention relates to a forced convection oven,
 particularly for community kitchens and the like, provided
 with means for ensuring uniform distribution of the heat in
 the interior of a cooking chamber and for thus improving
10 the uniformity of the cooking condition of foods in the
 cooking chamber.

 As generally known, uniform cooking of foods in this type
 of an oven presents certain difficulties due to the fact
 that the heated air circulated by a motor-driven fan mounted
15 adjacent one wall of the cooking chamber flows to the var-
 ious zones in the cooking chambers at different speeds.

 In addition, and in particular in the case of community
 kitchen ovens containing a plurality of shelves for dis-
20 posing food containers thereon, the heated air tends to
 circulate along preferential paths, resulting in the heat
 accumulating in specific zones.

 For reasons relating to the dimensions and to the utility
25 of an oven of this type, it is frequently preferred to in-
 stall the motor-driven fan adjacent a lateral wall of the
 cooking chamber instead of adjacent the rear wall thereof.
 Also to be kept in mind is the advisability of providing a
 transparent door (usually of a heat-resistant glass) which
30 permits the cooking process to be observed without having
 to open the door with the resultant considerable loss of
 heat and danger to the operator.

 There have already been proposed various solutions for satis-
35 fying these apparently contradictory demands.

 A first such solution provides for the empirically determ-
 ined positioning of deflector means in or adjacent an outlet

1 chamber of the motor-driven fan. This solution permits the
motor-driven fan to be positioned laterally and a trans-
parent door to be used, but leads to relatively poor results
as regards uniform cooking of the foods. A somewhat super-
5 ior solution by comparison to the one outlined above con-
sists in locating lateral air distributors in the interior
of the cooking chamber. These distributors are in the form
of metal sheet members provided with suitably arranged and
dimensioned perforations and capable of regulating the air
10 circulation, but permitting the interior of the oven through
the closed door only if the motor-driven fan is mounted
adjacent the rear wall. A further solution, optionally to
be employed in combination with the above mentioned air
distributors, provides for the installation of air outlet
15 ducts of variable cross-section for obtaining uniform vel-
ocity of the air outflow from the perforations of the
distributors. This solution is also subject to the limit-
ations of the preceding solution, and additionally results
in a more complicated construction of the oven, as it
20 requires the cooking chamber to be designed with inclined
walls.

It is an object of the present invention to provide a
forced convection oven having a transparent door permitting
25 the cooking process to be observed from outside, and with-
out restrictions as to the location of the motor-driven fan,
which may preferably be installed at a lateral position of
the oven. It is particularly intended to provide an oven of
the type defined above which is capable of ensuring im-
30 proved uniformity of the distribution of heat in the inter-
ior of the cooking chamber.

These objects are attained according to the invention by a
forced convection oven, particularly for community kitchens
35 and the like, comprising a cooking chamber and mounted
therein a motor-driven fan provided with an air diffuser,
this oven being characterized in that said air diffuser is
of circular configuration and disposed immediately adjacent

1 the rotor of said fan, and is provided with a plurality of
blades of curvilinear shape for ensuring the outflow of the
air towards said cooking chamber in substantially radial
directions with respect to the axis of said fan and at a
5 relatively low velocity.

These and other characteristics of the invention will become
more clearly evident from the following description, given
by way of example with reference to the accompanying draw-
10 ings, wherein:

fig. 1 shows in diagrammatical representation a horizontal
sectional view of an oven according to the invention,
and
15 fig. 2 shows a sectional view of the oven taken along the
line II-II in Fig. 1.

The oven shown in figs. 1 and 2 of the drawings comprises
a cooking chamber 5 having an access opening closed by a
20 transparent door 6 and located at the front of the oven.

Provided within cooking chamber 5 is an arrangement of
rails 7 for carrying a number of shelves 8 adapted to have
containers for the foods to be cooked placed thereon.

25

Also within cooking chamber 5 and mounted adjacent a lateral
wall thereof is a fan 9 driven by an electric motor 10, the
latter being housed in a lateral housing portion 11 and
operatively connected to fan 9 through a shaft extending
30 through the respective lateral wall of the cooking chamber.
Mounted between fan 9 and shelves 8 is a partition 12 formed
with bent edge portions so as to define an air outlet duct
leading towards the cooking chamber. Partition 12 is further
formed with a circular central opening 14 for the return of
35 the air from the cooking chamber to the fan. Disposed around
fan 9 are electric resistance heaters 15 for heating the air
supplied to the cooking chamber. According to the invention,
a circular diffuser 16 having a plurality of blades 17 of

1 curvilinear shape is disposed between fan 9 and resistance
heaters 15.

The number and the shape of blades 17 are determined as a
5 function of the characteristics of the fan so as to ensure
the outflow of the air through passage 13 towards the
cooking chamber in substantially radial directions with
respect to the axis of fan 9 and at a relatively low veloc-
ity.

10

By way of example it has been calculated that the outflow
velocity of the air from fan 9 may for instance be
30 to 40 m/sec, while the outflow velocity from diffuser
16 is reduced by the factor 10, i.e. to about 3 to 4 m/sec.

15

As generally known, in fact, a fan located at the center of
a cooking chamber of rectangular cross-section will circulate
the air at considerably different velocities and pressures
at the four corners of the outlet chamber due to the
20 prevalently tangential escape of the air from the fan.

This results in considerable differences of the air flow
velocity in different zones of the cooking chamber, and
thus in non-uniform cooking of the foods.

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In contrast thereto, the employ of diffuser 16 in the
solution according to the invention results in a reduced
air flow velocity and a more uniform pressure distribution
in the outlet chamber, so that the air escapes from passage
30 13 at a uniform velocity, and is distributed within the
cooking chamber in such a manner as to ensure more uniform
cooking temperatures at all positions on shelves 8.

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GRÜNECKER, KINKELDEY, STOCKMAIR & PARTNER

PATENTANWÄLTE
EUROPEAN PATENT ATTORNEYS

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A GRÜNECKER, DPL. ING.
 DR. H. KINKELDEY, DPL. ING.
 DR. W. STOCKMAIR, DPL. ING. ABT. TECH.
 DR. K. SCHUMANN, DPL. PHYS.
 P. H. JAKOB, DPL. ING.
 DR. G. BEZOLD, DPL. CHEM.
 W. MEISTER, DPL. ING.
 H. HILGERS, DPL. ING.
 DR. H. MEYER-PLATH, DPL. ING.
 DR. M. BOTT-BODENHAUSEN, DPL. PHYS.
 DR. U. KINKELDEY, DPL. BIOL.

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*LICENCE EN DROIT DE L'UNIV. DE GENÈVE

8000 MÜNCHEN 22
MAXIMILIANSTRASSE 58

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Forced Convection Oven .Patent Claims

25 1. A forced convection oven, particularly for community
 kitchens and the like, comprising a cooking chamber and
 mounted therein a motor-driven fan provided with an air
 diffuser, characterized in that said air diffuser (16) is
 of circular configuration and disposed immediately adjacent
 30 the rotor of said fan (9), and is provided with a plurality
 of blades (17) of curvilinear shape for ensuring the outflow
 of the air towards said cooking chamber (5) in substantially
 radial directions with respect to the axis of said fan (9)
 and at a relatively low velocity.

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2. A forced convection oven according to claim 1,
 characterized in that said circular diffuser (16) is mounted
 between said fan rotor (9) and the electric resistance
 heater elements (15) of said oven.

